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Observations of Rainbow Trout (*Oncorhynchus mykiss*) In Newfoundland 1976 to 1999

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Abstract

Rainbow trout (*Oncorhynchus mykiss*) were successfully introduced into several areas of Newfoundland in the late 1800s and early 1900s. Observations of rainbow trout outside these areas first occurred in 1976 commensurate with the development and expansion of marine cage rearing of rainbow trout elsewhere in Atlantic Canada. The reports of rainbow trout have increased in recent years; as well there has been an increase in the number of rivers where rainbow trout have been observed. Mixed-sex diploid rainbow trout have been identified in rivers with Atlantic salmon populations on the West Coast of Newfoundland. Some of the rainbow trout are believed to be of non-Newfoundland origin. There is concern that new populations could be established and negatively affect the productivity of Atlantic salmon and brook trout.

Résumé

À la fin du XIX^{e} siècle et au début du XX^{e} siècle, des truites arc-en-ciel (*Oncorhynchus mykiss*) ont été introduites avec succès dans plusieurs régions de Terre-Neuve. On a observé des truites arc-en-ciel hors de ces régions pour la première fois en 1976, ce qui correspond au début du développement de l'élevage en cage de truites arc-en-ciel dans le milieu marin, ailleurs dans le Canada atlantique. Depuis quelques années, les observations de truites arc-en-ciel augmentent, de même que le nombre de rivières où leur présence est relevée. On a trouvé des truites arc-en-ciel diploïdes des deux sexes dans des rivières de la côte ouest de Terre-Neuve occupées par des populations de saumon atlantique. On croit que certaines des truites arc-en-ciel proviennent de l'extérieur de Terre-Neuve. On craint que de nouvelles populations ne s'établissent et ne nuisent à la productivité du saumon atlantique et de l'omble de fontaine.

INTRODUCTION

Rainbow trout (*Oncorhynchus mykiss*) are not native to Newfoundland. They were first introduced in 1887 (Scott and Crossman, 1964), and stocking continued in the early 1900's (Andrews, 1965). Populations have become established in several small watersheds on the Northeast Avalon Peninsula, four small streams in the Clarenville area, Shalloway Pond Brook (Placentia Bay) and a watershed at Tilt Cove, Baie Verte Peninsula (Table 1 and Fig 1). These populations are all freshwater resident populations, except for the populations near Clarenville and Shalloway Pond Brook, which are known to have an anadromous component. Although Scott and Crossman (1964) indicated that small landlocked populations have been reported from the Notre Dame Bay Area (SFA 4) and small lakes near Corner Brook (SFA 13), these reports have not been confirmed even though considerable angling has occurred in these areas for brook trout (*Salvelinus fontinalis*) and Atlantic salmon (*Salmo salar*).

Rainbow trout had not been observed in areas other than those mentioned above until the mid-1970s when marine and estuarine rainbow trout aquaculture commenced. This Research Document provides documentation of observations of rainbow trout outside the areas where populations had been established in the early 1900s.

Methods

The observations of rainbow trout reported in this document were obtained from published literature, sampled or observed by the Department of Fisheries and Oceans (DFO) research staff, DFO Fisheries Officers and River Guardians, and anglers.

Results

A small aquaculture operation for rainbow trout was established at Hopeall, Trinity Bay (SFA 6), in 1976 and 1977 (Jamieson 1978 and 1980). The initial broodstock was obtained from resident wild populations on the Northeast Avalon Peninsula (Fig 1). Anglers captured rainbow trout that had escaped from cage rearing operations at Hopeall in the late 1970's and 1980's. There are no reports of rainbow trout being angled in recent years.

Marine cage rearing of triploid rainbow trout began in the late 1980s in Bay d'Espoir, on the South Coast of Newfoundland. Triploid rainbow trout have been observed in rivers in Bay d'Espoir since 1990 (Dempson et al, 1999 and 2000). The first reported occurrence of rainbow trout on the South Coast outside of Bay d'Espoir occurred in 1998 (Table 2).

From 1979 to 1995, small numbers of rainbow trout were reported captured at sea and in rivers on the West Coast of Newfoundland. The frequency of observations and distribution of rainbow trout in rivers increased in the mid to late 1990s and appears to be more extensive in 1999 than in previous years particularly along the South and West coasts of Newfoundland (Table 2). Anglers who were fishing for anadromous Atlantic salmon had captured most of the rainbow trout reported. In 1999, there were reports of rainbow trout in six rivers on the West

Coast, and in five rivers and in a commercial fishermen's bait net on the South Coast (Table 2). Only six rainbow trout captured outside Bay d'Espoir, 1979-99, were sexed. Four of these were males and two were females (Table 2).

There is no definitive evidence to confirm the origin of the rainbow trout observed. The circumstantial evidence would suggest that some, if not all, of those fish on the West Coast of Newfoundland are of non-Newfoundland origin. The evidence is as follows: 1) there are no known naturally reproducing populations on the West Coast; 2) some occurrences were before the development of the aquaculture industry in Bay d'Espoir; 3) some of the specimens that were sampled were identified as diploid male rainbow trout; 4) aquaculture operations in Bay d'Espoir had been using all-female triploid rainbow trout. The closest marine rainbow trout aquaculture site outside Newfoundland is on Cape Breton Island, Nova Scotia.

Conclusion

Small numbers of rainbow trout were first reported on the West Coast of Newfoundland in 1979 and increased in occurrence in the 1990s coincident with expansion of marine cage rearing of rainbow trout in Nova Scotia and in Newfoundland. There is concern that straying of reproductively viable diploid rainbow of both sexes could result in successfully establishing populations in new areas of Newfoundland, particularly on the West Coast where environmental conditions are most conducive to successful reproduction. Colonisation of rainbow trout could have a serious negative impact on the productivity of indigenous Atlantic salmon and brook trout populations. The risk of extending the range of rainbow trout could increase with marine cage rearing of all-female diploid rainbow trout in Newfoundland.

References

Andrews, C. A. 1965. Early importation and distribution of exotic fresh water fish species in Newfoundland. Published by Newfoundland Game and Fish Protection Society Ltd. 30p.

Chadwick, E. M. P. and W. J. Bruce. 1981. Range extension of steelhead trout (*Salmo gairdneri)* in Newfoundland. Naturaliste Can., 108: 301-303.

Dempson, J. B., G. Furey, and M. Bloom. 1999. Status of Atlantic salmon in Conne River, SFA 11, Newfoundland, 1998. DFO Canadian Stock Assessment Secretariat. Res. Doc. 99/98. 51 p.

Dempson, J. B., G. Furey, and M. Bloom. 2000. Status of Atlantic salmon in Conne River, SFA 11, Newfoundland, 1999. DFO Canadian Stock Assessment Secretariat. Res. Doc. 2000/03298. 51 p.

Jamieson, A., 1978. A report on the establishment and operation (18 months) of a rainbow trout hatchery/farm at Hopeall, Trinity Bay, Newfoundland. Fish. Mar. Serv. Internal Report. 56 p.

Jamieson, A. 1980. The cage rearing of rainbow trout in a brackish water pond in Newfoundland, 1978. Can. Ind. Rept. Fish. Aquat. Sci. 115: 18 p.

Porter, T. R. 2000. Status of Atlantic salmon (*Salmo salar* L.) populations in Crabbes and Robinsons rivers, and Middle Barachois, Fischells, and Flat Bay brooks, Newfoundland, 1999. DFO Canadian Stock Assessment Secretariat. Res. Doc. 2000/042. 42 p.

Porter, T. R., L. G. Riche, and G. R. Traverse. 1974. Catalogue of Rivers in Insular Newfoundland. Vol. A. Resource Dev. Br., Fish. and Mar. Serv., Dept Env. Data Record Series No. New/D-74-9. p 277.

Scott, W. B. and E. J. Crossman, 1964. Fishes occurring in the fresh waters of Newfoundland. Can Dept Fisheries and Life Sciences, Royal Ontario Museum, University of Toronto Contribution No. 58. 30-34

Table 1. Areas where rainbow trout are known to have established populations.

Map #	Year	Location	Comments (Source of information)
21	1887-1950's	Several small steams and ponds NE Avalon	Population established from stocking 1890 to 1950's. **(Andrews 1965; Scott and Crossman, 1964)**
23	Early 1900's	Shoal Harbour Bk, Georges Bk, lower Shoal Harbour Bk, Adeytown Bk.	Population established from stocking in early 1900's. **(Andrews 1965).** Samples collected in 1974 **(Anon, 1974).** One male trout found dead by angler in lower Shoal Harbour River July 6, 1984 **(DFO files).**
24	Early 1900's	One watershed at Tilt Cove	Population established from stocking, date unknown **(Scott and Crossman, 1964).** Samples collected in 1987 **(O'Connell pers comm)**
19	Early 1900's	Shalloway Pond Brook	Population established from stocking, date unknown **(Porter *et al* 1974).**

Table 2. Observed and reported occurrences of rainbow trout outside river systems where there are established populations.

Map #	Year	Location	Sex	Number	Comments (Source of information)
22	1976–85	Steams near Hopeall			Angled during late 1970's and early 1980's **(DFO Fisheries Officers).** Assumed to be escapes from aquac.
1	1979	Watt's Bight Brook	M (1) (external)	3	Angled (late May) **(Chadwick and Bruce, 1981)**
4	1980	Ocean - Daniels Harbour	M (internal)	1	Caught in commercial salmon net July 2, 1980. **(Chadwick and Bruce, 1981)**
8	1980	Serpentine River		2	Angled early July. **(Chadwick and Bruce, 1981)**
6	1981	Trout River	F (1) (external)	4	Angled in early September. One fish sampled **(Chadwick and Bruce, 1981)** Identified as hatchery origin **(author)**
2	1985-95	River of Ponds			Rainbow trout angled in lower part of river in Aug 1985-95, average weight 1.5-2 lbs. **(Fisheries Officer)**
15	1990	Conne River		3	1 in downstream trap; 1 in upstream trap;1 found dead on beach **(Dempson *et al.* 1999)**
15	1991	Conne River		47	18 angled; 3 in upstream trap; 5 in downstream trap; 21 observed in river. There maybe some double counting. **(Dempson *et al.* 1999)**
15	1992	Conne River		3	2 in downstream and 1 in upstream trap **(Dempson *et al.* 1999)**
15	1993	Conne River		11	8 in downstream and 3 in upstream trap **(Dempson *et al.* 1999)**
15	1994	Conne River		13	5 in downstream and 5 in upstream trap; 2 captured electro-fishing
15	1995	Conne River		39	5 in downstream and 16 in upstream trap; 16 observed underwater; 2 dead on fence. There maybe some double counting. **(Dempson *et al.* 1999)**
2	1995	River of Ponds	M (1)	3	Angled in August. Only one sexed. **(Fisheries Officer)**
5	1995	Parsons Pond			Angled **(Fisheries Officer)**
9	1995	Flat Bay Brook	M (1)	1	Caught in upstream trap **(Bourgeois pers comm)**

Table 2 cont'd. Observed and reported occurrences of rainbow trout outside river systems where there are established populations.

Map #	Year	Location	Sex	Number	Comments (Source of information)
15	1996	Conne River		41	2 in downstream and 16 in upstream trap; 22 observed underwater; 1 mortality at fence. There maybe some double counting **(Dempson *et al.* 1999)**
16	1996	Little River		5	5 in upstream trap **(Bourgeois pers comm)**
15	1997	Conne River		61	5 in downstream and 3 in upstream trap; 61 observed underwater; 2 mortalities at fence. There maybe some double counting. **(Dempson *et al.* 1999)**
15	1998	Conne River		27	1 in downstream and 3 in upstream trap; 21 observed underwater. There maybe some double counting. **(Dempson *et al.* 1999)**
17	1998	Long Harbour River		1+	Angled in lower river **(Angler)**
18	1998	Grand Bank Bk		1+	Several angled in estuary **(Fisheries Officer)**
20	1998	Biscay Bay Bk		2	Angled in lower river. **(Angler)**
2	1999	River of Ponds		24	Angled **(River Guardian)**
3	1999	Portland Creek		1	Angled **(River Guardian)**
6	1999	Trout River	F (1)	1+	Several angled in August **(Angler and Fisheries Officer)**
7	1999	Humber River		3	Angled **(Angler)**
9	1999	Flat Bay Brook		2	Observed during snorkelling survey **(Porter, 2000)**
10	1999	Robinsons River		2	Observed during snorkelling survey **(Porter, 2000)**
11	1999	Marine, near Burnt Island		6 or 7	Caught in commercial bait net **(Reported by angler)**
13	1999	La Poile River		3	Angled **(River Guardian)**
12	1999	Garia Brook		3	Angled **(River Guardian)**
15	1999	Conne River		137	3 in upstream trap; 116 observed underwater; 18 angled April 23- Aug 12. There maybe some double counting. **(Dempson *et al.* 2000)**
14	1999	Marine Bay d'Espoir and streams flowing into Bay d'Espoir		3,650	Angled **(River Guardians)**
16	1999	Little River		1	Upstream trap **(Bourgeois pers comm)**

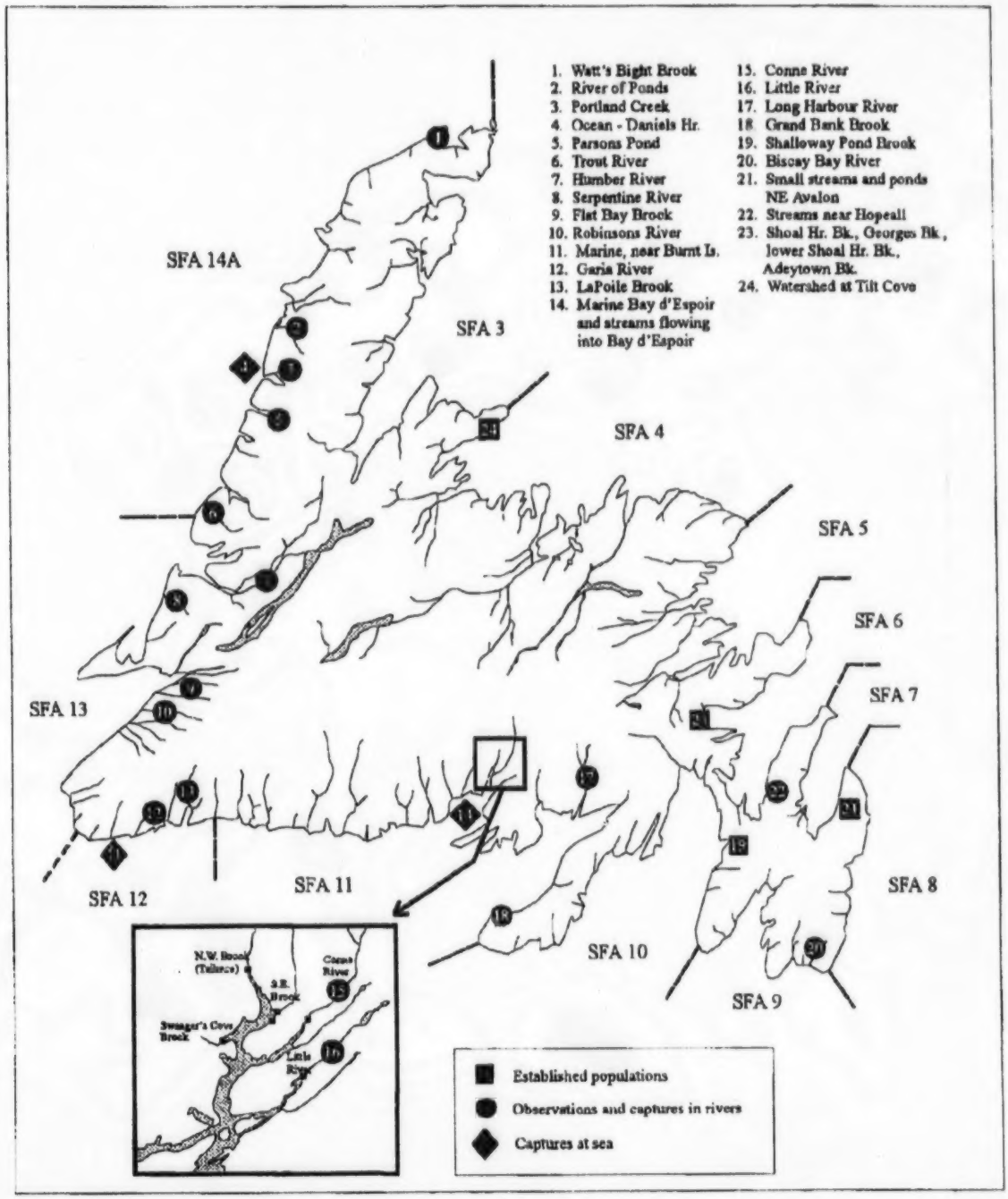

Figure 1 . Locations of Rainbow trout sightings in Newfoundland.